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Automatically analyzing parking signs to determine the validity of a parking spot

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ABSTRACT

This disclosure describes techniques to automatically determine the validity of a parking spot by using image recognition to recognize the parking sign and restrictions therein. With user permission, the text obtained from the parking sign is cross-referenced with contextual data such as the day of the week, the time of the day, the location of the parking sign, etc. to determine the validity of the parking spot. If the validity of the parking spot is confirmed, a countdown timer is started that triggers when the validity expires. A reminder pin for where the vehicle is parked is provided on a map.

KEYWORDS

- Text recognition
- Image recognition
- Parking sign
- Parking space
- Reminder
- Virtual assistant

BACKGROUND

Software applications or services that provide maps, navigation, or search capabilities enable users to search for and navigate to various destinations. However, once the destination is reached, there is generally no assistance provided for parking. Restrictions described on a parking sign, e.g., “M W F 2-4 PM / 20 min / No return within 40 min” are often such that users can easily make errors in assessing if they can legally park at that location. Drivers are thereby often issued parking tickets that are easily avoided.

DESCRIPTION

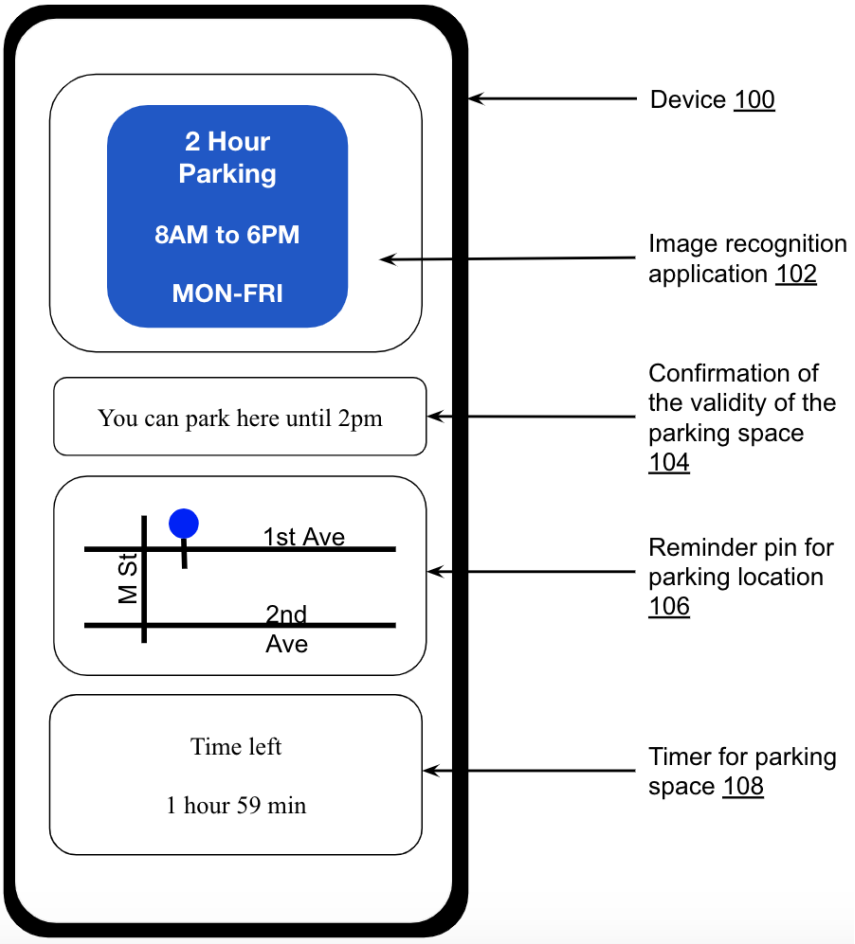

Fig. 1: Visually analyzing parking signs to determine the validity of a parking spot

Fig. 1 illustrates an example in which an image recognition application analyzes a parking sign to determine the validity of a parking spot. The user parks their vehicle and captures an image of a parking sign, e.g., with a mobile device (100). The image recognition application (102) recognizes the parking sign and parking restrictions included therein. The parking restrictions data is cross-referenced with data such as the day of the week, the time of the day, the location of the parking sign, etc. When the validity of the parking spot is confirmed, a notification to that effect is provided to the user (104). Additionally, a timer is started for the remaining parking time (108) as determined from the restrictions on the parking sign. A

reminder pin of the parking location (106) is provided on a map. If the parking sign indicates that parking in the spot is not permitted, the user is provided an alert. In this manner, parking signs can be quickly and efficiently analyzed to determine the validity of a parking spot and to reduce user uncertainty. The described techniques are implemented with user permission to access user data such as user location, date/time, etc. The user can choose to accept or decline providing their current location.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques to automatically determine the validity of a parking spot by using image recognition to recognize the parking sign and restrictions therein. With user permission, the text obtained from the parking sign is cross-referenced with contextual data such as the day of the week, the time of the day, the location of the parking sign, etc. to determine the validity of the parking spot. If the validity of the parking spot is confirmed, a countdown timer is

started that triggers when the validity expires. A reminder pin for where the vehicle is parked is provided on a map.